Monitoring Study Group Meeting Minutes

April 7, 2005
Mendocino County Museum, Willits, CA

The following people attended the MSG meeting: Eric Huff (BOF), Mike Laing (N.CA Fed. Fly Fishers), Angela Wilson (CVRWQCB), John Munn (CDF), Dr. Richard Harris (UCB), Tom Spittler (CGS), Anthony Lukacic (CDF), Kevin Faucher (CTM), Stephen Levesque (CTM), Joe Croteau (DFG), Stuart Farber (Timber Products Co.), Rich Klug (Roseburg Resources Co.), Peter Ribar (CTM), Mark Hannon (CTM), Liz Keppeler (USFS-PSW), Gretchen Oliver (PALCO), Kirk Vodopals (MRC), Marc Jameson (CDF-JDSF), and Clay Brandow (CDF). **[Note: action items are shown in bold print]**.

The meeting was chaired by Eric Huff, Executive Officer for the Foresters Licensing Program. We began the meeting with general monitoring related announcements:

- Clay Brandow reported that Dr. Cajun James, SPI, has organized a turbidity and suspended sediment measurement workshop entitled "Water Quality Monitoring Conference II" in Redding at the Holiday Inn on April 26, 2005. This is an excellent one-day conference, with a cost of $85. Contact Sherry Cooper, UCCE, Redding, for additional information:
  slcooper@nature.berkeley.edu
  http://nature.berkeley.edu/forestry/waterquality/

- Clay Brandow announced that the California Forest Futures 2005 Conference will be held at the Sacramento Convention Center on May 23-24, 2005. The conference will examine the forces re-shaping our forest landscapes and explore the strategies and actions necessary to secure an economic and ecologically rewarding future. More information is available from Sherry Cooper at:
  slcooper@nature.berkeley.edu
  http://nature.berkeley.edu/forestry/forestfuture/

- Richard Harris provided an update on the UC crossing upgrade study. Jared Gerstein has secured 1.5 years worth of funding to evaluate channel adjustments following the installation of new culverts on forest lands. Pete Cafferata has circulated the current study plan to the MSG electronic mailing list.

- Richard Harris stated that the set of DFG monitoring protocols for salmonid habitat restoration projects is now a completed project and available on the web at: http://nature.berkeley.edu/forestry/comp_proj/dfg.html

- Tom Spittler provided an update on BOF Road Rules committee work. The group has compiled all the road–related Forest Practice Rules (FPRs), and is making progress towards streamlining and clarifying the existing rules. Tom stressed that this is an inter-agency effort. The committee last met on April 6, 2005 at Howard Forest near Willits.

CDF/BOF/MSG Monitoring Efforts

Following these announcements, Clay Brandow provided the group with a PowerPoint presentation on the Draft Analysis of the Modified Completion Report Monitoring (MCR) data. The presentation is available on-line in the Monitoring Study Group's section of the BOF's website at: http://www.bof.fire.ca.gov/board/msg_archives.html. The MCR program was set up to monitor the implementation and effectiveness of the Forest Practice Rules (FPRs) in protecting water quality. CDF Forest Practice Inspectors completed this monitoring work. MCR monitoring focused on WLPZ total canopy, roads, and watercourse crossings, based on data collected during the Hillslope Monitoring Program.

WLPZ percent total canopy results were generally adequate and very similar to the results of the Hillslope Monitoring Program, both by region and by watercourse class. Similarly, road rule implementation was found to be good. The rate of departure from the Forest Practice Rules was about 4% overall. The departure rate was higher in the inland Forest Practice Districts (R-2 and R-4) than in the Coast District (R-1). The road-related departures from the FPRs exhibit a pattern. In a word it's drainage. Eight drainage-related FPRs account for 95% of the road-related departures found. Road-related rules, when properly implemented, were found to be highly effective in preventing erosion, sediment transport, and transport to channels. Conversely, departures from the road-related rules were much more likely to result in erosion, and subsequent sediment transport and transport to channels than road-related rules that were implemented at an acceptable level. Looking at watercourse crossings, departure rates were low and they are lower for new culverts than for existing culverts installed prior to the THP. Based on effectiveness data collected, areas that appear to need improvement include diversion potential of crossing fills (lack of a critical dips), maintenance related to plugging, and scour at the outlet of culverts. Data collection was suspended in July of 2004, due to a 50% reduction in the number of Forest Practice Inspectors spawned by budget uncertainties. **Current priorities are: 1) to write-up the results from 2001 through 2004 MCR Monitoring in a final report, and 2) retool and re-implement the Modified Completion Report (MCR) monitoring program with CDF Forest Practice Inspectors to complement the proposed Interagency Mitigation Monitoring Program (IMMP).**

Next on the agenda, Clay Brandow gave a brief update on the newly proposed Interagency Mitigation Monitoring Program, based on notes provided by Pete Cafferata. The basic concept for the IMMP is to form dedicated interagency teams for each region, made up of the Review Team agencies, with possible RPF and public participation. CDF is seeking assistance from the other agencies to form field teams in Redding, Fresno, and Santa Rosa. An MSG subcommittee has been assembled to further define the IMMP and the group met on March 14th. While the other agencies have a strong interest in the program, funding may be needed for a firm commitment for significant field time. The group discussed the value of having the IMMP attempt to use a performance-based approach to evaluate mitigation effectiveness, taking into account implementation of the practice. **When more is known regarding possible Review Team agency participation, a date will be established for a second IMMP subcommittee meeting.**

The IMMP update was followed by a general discussion. Key points raised in the discussion included: 1) how to gain participation and support by the key agencies, 2) solving the inter-agency credibility problem, 3) given that the RWQCBs will be requiring extensive monitoring under waivers and WDRs, how the IMMP fits into the bigger monitoring scheme related to timber operations, 4) developing key questions for the IMMP to address, 5) determining if the scope of the IMMP should be expanded beyond water quality to include habitat issues, and 6) determining if the IMMP should focus on a single item, such as watercourse crossings stratified by 1600 permits, rather than evaluating implementation and effectiveness of key THP/NTMP features and additional mitigation measures. The discussion resulted in more questions than answers concerning the IMMP.

Presentations on Other Monitoring Projects

After lunch, Kevin Faucher of Campbell Timberland Management provided a PowerPoint presentation on the South Fork Ten Mile Sediment Transport Monitoring Project, including results from water years 2002 through 2004. Purposes of the monitoring include: 1) validation of sediment delivery estimates developed from aerial photo mapping as part of the TMDL, 2) establishment of a long-term monitoring program on a watershed/sub-basin level, 3) demonstration of watershed trends quantitatively, 4) development of regional data sets, and 5) identification of the need for forensic analysis of large scale sediment sources. Stream depth (stage), stream flow (discharge), continuous turbidity, and depth-integrated suspended sediment concentration are monitored at seven locations in the watershed. Bridges tend to make good monitoring sites.

The three years of data collected have been used to begin establishing important relationships for each site, including: stage vs. discharge, suspended sediment concentration vs. discharge, suspended sediment load vs. discharge, and suspended sediment concentration vs. turbidity. Three-years worth of annual suspended sediment loads have been calculated for the Lower SF of Ten Mile River station and for the six sub-basins. As expected, there is considerable variation from site to site and year to year. The actual annual SF Ten Mile River suspended sediment load for each of the three years monitored was well over the 6,000 tons/year estimated in the TMDL. Suspended sediment loads for water years 2002, 2003 and 2004 were roughly 13,000, 19,000, and 10,000 tons/year, respectively, for the 37.4 square mile watershed.

In the Redwood Creek tributary to SF Ten Mile, some high turbidity values have been measured, reaching 800 NTUs at one point in time. A forensic investigation was conducted by tracking the turbid waters upstream. High in the Redwood Creek watershed, just above the Hawthorne property, a landslide had swept across the creek and this proved to be the source of the high turbidity measured just down stream. Interestingly, due to dilution and other factors, this high turbidity pulse was not detectible at the SF Ten Mile Monitoring Station below Smith Creek. Kevin summarized what has been learned to date, including that: 1) relationships between stream stage and discharge are easily changed by shifting stream channel bottoms, 2) it is critical to have accurate rating curves at the high end for computation of sediment loads, since peak flows drive sediment transport, 3) measurements of turbidity and suspended sediment

near the storm peak are also critical to making accurate sediment load computations, and 4) large-scale erosion events can easily be detected by increases in turbidity, at least in the stream channel that they occur. Two take home lessons from this work are: 1) reliable flow measurements are essential, and 2) a great deal of time-consuming fieldwork is required to verify automatically collected data.

Next, Samantha Hadden, a Humboldt State University graduate student, gave a PowerPoint presentation on her master's thesis entitled "Relative Effects of Organic and Inorganic Constituents on the Suspended Load on Salmonid Foraging and Prey Availability." She observed feeding success of fish both in natural streams and in the lab at various levels of turbidity. Organic particles in the suspended load have been found to contribute significantly to stream turbidities in the low to moderate range (< 60 NTU) on both ascending and descending limbs of a hydrograph. The foraging efficiency of juvenile salmonids were measured in both the field and laboratory at various turbidities and ratios of organic to inorganic particle concentrations. Field data were collected from 200-meter study reaches of the North and South Forks of Caspar Creek in Mendocino County, and Prairie and Little Lost Man Creeks in Humboldt County. Data were collected on six separate sampling events encompassing a range of stream discharges and turbidities. Feeding rate for coho salmon and steelhead trout declined throughout the range of turbidities sampled (4-50 NTU).

Feeding rates of juvenile steelhead trout were also measured in artificial stream channels in which individuals were offered live prey under differing levels of suspended sediment concentration and organic to inorganic particle ratios. Feeding trials were conducted at low (4-30 NTU) and high (42-68 NTU) levels of suspended sediment concentration (mg/L), and three different organic to inorganic particle ratios. Organic to inorganic particle ratios varied as 0.75:0.25, 0.50:0.50, and 0.25:0.75 by weight in grams. Foraging efficiency of juvenile steelhead trout was found to decrease significantly with experimental suspended sediment concentrations (SSC), but not among the three experimental organic to inorganic particle ratios. Both field and laboratory studies revealed that while the foraging efficiency of juvenile salmonids was decreased by increased turbidities, fish continued to capture prey at turbidity levels in the range of 40-50 NTUs. **Samantha's masters thesis will be posted on the MSG website when it is completed, since this project was partially supported by CDF.**

Updates on the Three Cooperative Instream Monitoring Projects

Brief updates on the three MSG cooperative instream effectiveness monitoring projects were provided.

Wages Creek Cooperative Instream Monitoring Project

Stephen Levesque and Kevin Faucher of Campbell Timberland Management updated the group on the Wages Creek Project. This season's pre-project storm turbidities have been very low, ranging up to 4 NTUs. The automatic pump sampler is set up to take samples for suspended sediment once stream turbidities cross a 10 NTU threshold. Also, on an administrative note, an agreement has been reached with the absentee

landowner for access for the new lower Wages Creek station, and the MOU between CTM and CDF has been signed by both parties and is fully executed.

Garcia River Cooperative Instream Monitoring Project

Clay Brandow provided a short update on Mendocino County RCD's Garcia River watershed project, based on notes provided by Pete Cafferata. Regarding the ISCO pumping sampler at the Mill Creek site, Teri Jo Barber reports that the first sample triggered by the high turbidity conditions was taken on February 19, 2005. On March 5, 2005, 18 samples were triggered by existing turbidity conditions. Since then, 14 additional samples have been taken. Occasionally a pumped sample is initiated to compare to a manually obtained depth integrated sample taken at the same time. **John Munn is attempting to fund the processing of the samples with his Soil Erosion Studies Project account.** Additionally, Teri Jo reports that 42 buckets of spawning gravels sampled in summer 2004 at the Garcia River tributary stations were recently sieved into particle size classes at Graham Matthew's sediment lab in Arcata. The gravel size information will be coupled with spawning gravel permeability and embeddedness measurements recorded for the same locations and at the same time.

Judd Creek Cooperative Instream Monitoring Project

Clay Brandow provided a short update for the SPI Judd Creek Project, based on notes provided by Pete Cafferata. **The MOU between SPI and CDF for the Judd Creek project has been agreed to in principle, and is working its way through the senior staff review process at CDF. When signed by the Director, it will be sent to SPI for signature by Dan Tomascheski, Vice-President, Resources.** Dr. Cajun James reports that data collection at the five monitoring sites in Judd Creek is progressing well. However, a considerable amount of snow fell in the watershed this winter, and at some of the sites, the ISCO pumping sampler tubing froze solid, prohibiting sample collection. Dr. James has been comparing instream turbidity values to turbidity values determined with a Hach laboratory turbidimeter. In general, the instream values appear to be approximately one-third higher (30 to 50%) than the laboratory determined turbidity values. She will present this information at the Water Quality Monitoring II conference in Redding on April 26th. **Also, Dr. James will complete a revised Judd Creek study plan in the near future.**

Next MSG Meeting

The next MSG meeting was not scheduled, but tentatively, it is anticipated that it will occur in July at the Mendocino County Museum in Willits. The agenda will be emailed out and sent to the BOF's mailing list when it is available.